(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 4 424 838 A3**

(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
04.12.2024 Bulletin 2024/49

(43) Date of publication A2:
04.09.2024 Bulletin 2024/36

(21) Application number: **24174492.9**

(22) Date of filing: **24.11.2006**

(51) International Patent Classification (IPC):
C12Q 1/50 *(2006.01)* ***G01N 33/50*** *(2006.01)*
A61P 35/00 *(2006.01)* ***A61P 43/00*** *(2006.01)*

(52) Cooperative Patent Classification (CPC):
G01N 33/5008; A61P 35/00; A61P 43/00; C07D 213/81; C07D 213/86; C07D 215/38; C07D 239/42; C07D 239/48; C07D 239/84; C07D 253/075; C07D 401/04; C07D 401/12; C07D 401/14; C07D 403/12; C07D 405/12; (Cont.)

(84) Designated Contracting States:
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HU IE IS IT LI LT LU LV MC NL PL PT RO SE SI SK TR
Designated Extension States:
AL BA HR MK RS

(30) Priority: **23.11.2005 US 739477 P**
23.11.2005 US 73947605 P
02.12.2005 US 741767 P
16.12.2005 US 751030 P
13.03.2006 US 783106 P
23.03.2006 US 785904 P
23.03.2006 US 78581706 P
04.04.2006 US 789379 P
29.08.2006 PCT/US2006/033890

(62) Document number(s) of the earlier application(s) in accordance with Art. 76 EPC:
06838389.2 / 1 960 535

(71) Applicant: **Housey, Gerard M.**
Southfield, MI 48034 (US)

(72) Inventor: **Housey, Gerard M.**
Southfield, MI 48034 (US)

(74) Representative: **Witthoff Jaekel Steinecke**
Patentanwälte PartG mbB
Postfach 1140
52412 Jülich (DE)

(54) **COMPOUNDS AND METHODS OF IDENTIFYING, SYNTHESIZING, OPTIMIZING AND PROFILING PROTEIN MODULATORS**

(57) This invention relates to methods of identifying, synthesizing, optimizing and profiling compounds that are inhibitors or activators of proteins, both naturally occurring endogenous proteins as well as certain variant forms of endogenous proteins, and novel methods of identifying such variants. The method accelerates the identification and development of compounds as potential therapeutically effective drugs by simplifying the pharmaceutical discovery and creation process through improvements in hit identification, lead optimization, biological profiling, and rapid elimination of toxic compounds. Implementation results in overall cost, reductions in the drug discovery process resulting from the corresponding increases in efficiency.

EP 4 424 838 A3

(52) Cooperative Patent Classification (CPC): (Cont.)
C07D 405/14; C07D 407/14; C07D 409/14;
C07D 413/04; C07D 413/14; C07D 417/14;
G01N 33/5011; G01N 33/502

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 17 4492

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X,P	WO 2005/115992 A1 (HOUSEY PHARMACEUTICALS INC [US]; HOUSEY GERARD M [US]) 8 December 2005 (2005-12-08) * page 49 - page 51 * * page 54 - page 56 * * page 61 - page 64 * * claims 52-64 *	1-13	INV. G01N33/50 C12Q1/50 A61P35/00 A61P43/00 C07D213/81 C07D213/86 C07D215/38 C07D239/42 C07D239/48 C07D239/84 C07D253/075 C07D401/14 C07D403/12 C07D405/12 C07D405/14 C07D407/14 C07D409/14
E	WO 2007/037898 A2 (HOUSEY PHARMACEUTICALS INC [US]; HOUSEY GERARD M [US] HOUSEY GERARD M) 5 April 2007 (2007-04-05) * page 129 - page 134 *	1-13	
Y	HURON D R ET AL: "A Novel Pyridopyrimidine Inhibitor of Abl Kinase is a Picomolar Inhibitor of Bcr-abl-driven K562 Cells and Is Effective against STI571-resistant Bcr-abl Mutants", CLINICAL CANCER RESEARCH, ASSOCIATION FOR CANCER RESEARCH, US, vol. 9, 1 April 2003 (2003-04-01), pages 1267-1273, XP003023718, ISSN: 1078-0432 * the whole document *	1-13	TECHNICAL FIELDS SEARCHED (IPC) G01N
Y	VON BUBNOFF N ET AL: "Inhibition of Wild-Type and Mutant Bcr-Abl by Pyrido-Pyrimidine Type Small Molecule Kinase Inhibitors", CANCER RESEARCH, AMERICAN ASSOCIATION FOR CANCER RESEARCH, SAN DIEGO, CA . PHILADELPHIA (PA, vol. 63, 1 October 2003 (2003-10-01), pages 6395-6404, XP003023719, ISSN: 0008-5472 * the whole document *	1-13	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 October 2024	Bayer, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 17 4492

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	Nicholas Wolff: "PD166326, a novel tyrosine kinase inhibitor, has greater antileukemic activity than imatinib mesylate in a murine model of chronic myeloid leukemia", Blood, 1 May 2005 (2005-05-01), pages 3995-4003, XP055658332, DOI: 10.1182/blood-2004-09-3534 Retrieved from the Internet: URL:https://www.ncbi.nlm.nih.gov/pmc/articles/PMC1895078/ [retrieved on 2020-01-15] * the whole document *	1-13	C07D413/04 C07D413/14 C07D417/14 C07D401/04 C07D401/12
Y	T. O'HARE ET AL: "Inhibition of wild-type and mutant Bcr-Abl by AP23464, a potent ATP-based oncogenic protein kinase inhibitor: implications for CML", BLOOD, vol. 104, no. 8, 15 October 2004 (2004-10-15), pages 2532-2539, XP055452820, US ISSN: 0006-4971, DOI: 10.1182/blood-2004-05-1851 * the whole document *	1-13	TECHNICAL FIELDS SEARCHED (IPC)

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 October 2024	Bayer, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 17 4492

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
Y	L C CROSSMAN ET AL: "A single nucleotide polymorphism in the coding region of ABL and its effects on sensitivity to imatinib", BLOOD CANCER JOURNAL, vol. 19, no. 11, 8 September 2005 (2005-09-08), pages 1859-1862, XP055452823, London ISSN: 0887-6924, DOI: 10.1038/sj.leu.2403935 * the whole document *	1-13	
Y	CARTER TODD A ET AL: "Inhibition of drug-resistant mutants of ABL, KIT, and EGF receptor kinases", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES, NATIONAL ACADEMY OF SCIENCES, vol. 102, no. 31, 2 August 2005 (2005-08-02), pages 11011-11016, XP002440841, ISSN: 0027-8424, DOI: 10.1073/PNAS.0504952102 * the whole document *	1-13	TECHNICAL FIELDS SEARCHED (IPC)
Y	& TODD A. CARTER: "Inhibition of drug-resistant mutants of ABL, KIT, and EGF receptor kinases", PNAS (SUPPLEMENTARY INFORMATION), 2 August 2005 (2005-08-02), XP055658459, DOI: 10.1073/pnas.0504952102	1-13	

-/--

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 October 2024	Bayer, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

Europäisches Patentamt
European Patent Office
Office européen des brevets

EUROPEAN SEARCH REPORT

Application Number
EP 24 17 4492

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
	& Todd A. Carter: "Inhibition of drug-resistant mutants of ABL, KIT, and EGF receptor kinases ¦ PNAS", PNAS (Article + Suppl.), 2 August 2005 (2005-08-02), XP055658460, Retrieved from the Internet: URL:https://www.pnas.org/content/102/31/11011/tab-figures-data#F5 [retrieved on 2020-01-15] * the whole document * -----		
Y	PEDEMONTE NICOLETTA ET AL: "SMALL-MOLECULE CORRECTORS OF DEFECTIVE DELTAF508-CFTR CELLULAR PROCESSING IDENTIFIED BY HIGH-THROUGHPUT SCREENING", THE JOURNAL OF CLINICAL INVESTIGATION, B M J GROUP, vol. 115, no. 9, 1 September 2005 (2005-09-01), pages 2564-2571, XP009083656, DOI: 10.1172/JCI24898 * the whole document * -----	1-13	TECHNICAL FIELDS SEARCHED (IPC)
Y	PAUL LA ROSEE ET AL: "Activity of the Bcr-Abl kinase inhibitor PD180970 against clinically relevant Bcr-Abl isoforms that cause resistance to imatinib mesylate (Gleevec, STI571).", CANCER RESEARCH, vol. 62, no. 24, 1 December 2002 (2002-12-01), pages 7149-7153, XP055049991, San Diego, CA . Philadelphia (PA ISSN: 0008-5472 * the whole document * -----	1-13	

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
Munich	23 October 2024	Bayer, Martin

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT ON EUROPEAN PATENT APPLICATION NO. EP 24 17 4492

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report. The members are as contained in the European Patent Office EDP file on
The European Patent Office is in no way liable for these particulars which are merely given for the purpose of information.

23-10-2024

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2005115992 A1	08-12-2005	AU 2005247943 A1	08-12-2005
		CA 2567813 A1	08-12-2005
		CA 2904275 A1	08-12-2005
		CN 103356636 A	23-10-2013
		CN 106434833 A	22-02-2017
		DK 2447252 T3	16-03-2020
		EP 1751115 A1	14-02-2007
		EP 2447252 A2	02-05-2012
		EP 2612852 A1	10-07-2013
		EP 3461813 A1	03-04-2019
		ES 2777924 T3	06-08-2020
		JP 2008514547 A	08-05-2008
		JP 2013005810 A	10-01-2013
		JP 2015226544 A	17-12-2015
		JP 2017225445 A	28-12-2017
		JP 2020022463 A	13-02-2020
		JP 2022050418 A	30-03-2022
		KR 20070040760 A	17-04-2007
		NZ 552298 A	29-04-2011
		US 2008269262 A1	30-10-2008
		US 2013150358 A1	13-06-2013
		US 2015133441 A1	14-05-2015
		US 2017112848 A1	27-04-2017
		US 2018042935 A1	15-02-2018
		US 2020046718 A1	13-02-2020
		US 2021008077 A1	14-01-2021
		US 2021015825 A1	21-01-2021
		US 2022362257 A1	17-11-2022
		US 2022370469 A1	24-11-2022
		US 2024180916 A1	06-06-2024
		WO 2005115992 A1	08-12-2005
WO 2007037898 A2	05-04-2007	AU 2006295260 A1	05-04-2007
		CA 2620878 A1	05-04-2007
		CR 9775 A	15-01-2010
		EP 1928847 A2	11-06-2008
		JP 2009506125 A	12-02-2009
		KR 20080090381 A	08-10-2008
		NZ 566744 A	29-04-2011
		US 2010016298 A1	21-01-2010
		WO 2007037898 A2	05-04-2007

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82